SELF-DESCRIBING RE-USABLE SOFTWARE COMPONENTS

BACKGROUND

[0001] Software developers frequently build software components for others to reuse within their applications. For instance, software developers may create widgets, objects, world-wide-web ("Web") parts, Web services, models, workflows, and various other types of software components for others to reuse. This provides a great deal of efficiency for a user of a re-usable software component (hereinafter "a re-user") in that the re-user does not have to create the functionality provided by the re-usable software component.

[0002] In order to utilize a re-usable software component, a re-user needs to understand the capabilities that a re-usable software component provides. The re-user also needs to understand how to integrate the re-usable software component with other software components the re-user is already using. While a re-user that is a skilled programmer may be able to easily perform these tasks, re-users that are non-programmers may find it extremely difficult to understand and integrate re-usable software components with other software components in an appropriate fashion.

[0003] It is with respect to these considerations and others that the disclosure made herein is presented.

SUMMARY

[0004] Technologies are presented herein for providing, discovering, and integrating self-describing re-usable software components. In particular, through the implementations and embodiments presented herein, knowledge is provided at the time a re-usable software component is published that enables re-users to more easily understand the capabilities that a re-usable software component provides and how the re-usable software component connects to other software components. The published knowledge may also be utilized to discover an appropriate re-usable software component for a particular application and to integrate the re-usable software component with other compatible software components in a simplified manner.

[0005] According to one aspect presented herein, metadata is generated and published with a re-usable software component that identifies the capabilities of the software component, identifies other software components that the re-usable software component may be integrated with, and identifies mechanisms for integrating the re-usable software component with other software components. The metadata can then be used to discover re-usable software components and to integrate the re-usable software components with other software components. Integration may be performed in a completely automated fashion using the metadata. Alternatively, the metadata may be utilized to solicit a re-user for options regarding how the integration is to be performed. The integration may then be performed using the integration options specified by the re-user.

[0006] According to other aspects, the metadata published with a re-usable software component specifies one or more transformations for integrating the re-usable software component with other software components. The metadata may also indicate whether the mechanisms for integrating the re-usable software component with other software components are limited to use, or scoped for use, with any particular other software components. The metadata may further indicate whether the mechanisms for integrating the re-usable software component with other software components are scoped to any of the capabilities of the re-usable software component.

[0007] According to other aspects, a mechanism is also provided by which a re-user of the re-usable software component may publish additional metadata for use with the re-usable software component. The additional metadata may provide a popularity value indicating the popularity of the re-usable software component. The additional metadata may also provide an indication as to whether the mechanisms specified for integrating the re-usable software component with other software components were useful for an actual integration between the re-usable software component and another software component. The re-user may also be permitted to append additional metadata to the original metadata published with the re-usable software component.

[0008] It should be appreciated that the above-described subject matter may also be implemented as a computer-controlled apparatus, a computer process, a computing system, or as an article of manufacture such as a computer-readable medium. These and various other features will be apparent from a reading of the following Detailed Description and a review of the associated drawings.

[0009] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended that this Summary be used to limit the scope of the claimed subject matter. Furthermore, the claimed subject matter is not limited to implementations that solve any or all disadvantages noted in any part of this disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. **1** is a software architecture diagram showing aspects of a re-usable software component disclosed in embodiments presented herein;

[0011] FIG. **2** is a data structure diagram illustrating aspects of a knowledge element data structure utilized in embodiments presented herein;

[0012] FIG. **3** is a flow diagram showing an illustrative process for publishing a re-usable software component in one embodiment presented herein;

[0013] FIG. **4** is a flow diagram showing an illustrative process for discovering and integrating a re-usable software component in one embodiment presented herein; and

[0014] FIG. **5** is a computer architecture diagram showing an illustrative computer hardware architecture for a computing system capable of implementing aspects of the embodiments presented herein.

DETAILED DESCRIPTION

[0015] The following disclosure is directed to technologies for providing, discovering, and integrating self-describing re-usable software components. Through the use of the technologies and concepts presented herein, metadata is published with a re-usable software component that describes the capabilities, affinities, and integration mechanisms for the re-usable software component. Through the use of this metadata, the re-usable software component can be discovered and integrated with other software components in a fully or semi-automated manner.